

We claim:

1. A support member having a range of motion in one direction and essentially no range of motion in an opposite direction, said support member comprising:
a length of flexible material; and
a plurality of non-interlocking solids attached to said flexible material, wherein adjacent non-interlocking solids have portions that contact one another and restrict bending of said flexible material in one direction of movement, and wherein said portions of said non-interlocking solids separate from one another when said flexible material is activated in an opposite direction of movement, thereby permitting said flexible material to bend and assume a curved configuration.
2. The support member of claim 1 wherein said portions of said non-interlocking solids further comprise projections and concavities in mateable relationship with adjacent non-interlocking solids that serve as means for maintaining linear alignment of said support member.
3. The support member of claim 1 wherein said plurality of said non-interlocking solids are attached to one side of said flexible material.
4. The support member of claim 1 wherein said plurality of non-interlocking solids restrict bending of said flexible material in one direction of movement when said flexible material is in a straightened configuration.
5. The support member of claim 1 wherein said length of flexible material and said non-interlocking, motion-limiting, solids are in the form of a single construct.
6. The support member of claim 1 wherein said non-interlocking solids each have a profile substantially in the shape of a capital letter "T."
7. The support member of claim 1 wherein said flexible material is metallic.
8. The support member of claim 7 wherein the metallic material is in the form of a flat strip.
9. The support member of claim 8 further comprising a series of holes in said strip for attaching said plurality non-interlocking solids.

10. The support member of claim 1 wherein said flexible material is polymeric.
11. The support member of claim 1 wherein said solids are made of a metallic material.
12. The support member of claim 1 wherein said solids are made of a polymeric material.
13. The support member of claims 11 wherein said solids are substantially similar in volume.
14. The support member of claims 12 wherein said solids are substantially similar in volume.
15. The support member of claim 1 further comprising an envelope surrounding said support member and at least one channel disposed substantially in parallel with said support member and attached to said envelope.
16. The support member of claim 15 wherein said channel is contiguous with said envelope.
17. The support member of claim 15 further comprising at least one conductor located within said at least one channel.
18. The support member of claim 15 wherein said envelope and said at least one channel comprise a polymeric material.
19. The support member of claim 18 wherein said polymeric material comprises polytetrafluoroethylene.
20. The support member of claim 15 wherein said envelope and said at least one channel are both a composite of urethane and polytetrafluoroethylene.
21. The support member of claim 20 wherein said polytetrafluoroethylene is expanded porous polytetrafluoroethylene.

22. A support member for an assembly having a range of motion in one direction and essentially no range of motion in an opposite direction, said support member comprising:
a length of flexible material;
a plurality of non-interlocking solids attached to said flexible material; and
at least one filament attached to said plurality of non-interlocking solids, wherein said at least one filament restricts motion of said flexible material in one direction of movement, and wherein said at least one filament does not restrict motion of said flexible material in an opposite direction of movement, thereby permitting said flexible material to bend and assume a curved configuration.
23. The support member of claim 22 wherein said non-interlocking solids are substantially similar in volume.
24. The support member of claim 22 wherein said solids are attached to one side of said flexible material.
25. The support member of claim 22 wherein said filament does not increase in length more than about 4 percent before breaking.
26. The support member of claim 22 wherein said flexible material and said filament appear substantially parallel when said support member is fully extended.
27. The support member of claim 22 further comprising a space between adjacent solids.
28. The support member of claim 22 wherein said filament is metallic.
29. The support member of claim 28 wherein said metallic filament is stainless steel.
30. The support member of claim 22 wherein said filament comprises a polymeric material.
31. The support member of claim 30 wherein said polymeric material is an aramid fiber.
32. The support member of claim 22 wherein said flexible material is metallic.
33. The support member of claim 32 wherein the metallic material is in the form of a flat strip.

34. The support member of claim 33 further comprising a series of holes in said strip for attaching said plurality non-interlocking solids.
35. The support member of claim 22 wherein said flexible material is polymeric.
36. The support member of claim 22 wherein said non-interlocking solids are made of a metallic material.
37. The support member of claim 22 wherein said non-interlocking solids are made of a polymeric material.
38. The support member of claim 22 further comprising an envelope surrounding said support member and at least one channel disposed substantially in parallel with said support member and attached to said envelope.
39. The support member of claim 38 wherein said channel is contiguous with said envelope.
40. The support member of claim 38 further comprising at least one conductor located within said at least one channel.
41. The support member of claim 38 wherein said envelope and said channel comprise a polytetrafluoroethylene material.
42. The support member of claim 38 wherein said envelope and said channel are both a composite of urethane and polytetrafluoroethylene.
43. The support member of claims 41 wherein said polytetrafluoroethylene is expanded porous polytetrafluoroethylene.
44. The support member of claims 42 wherein said polytetrafluoroethylene is expanded porous polytetrafluoroethylene.

45. A support element having a range of motion in one direction and essentially no range of motion in an opposite direction, said support member comprising:

a flexible member combined with a plurality of non-interlocking solids in a single construct, wherein adjacent non-interlocking solids have portions that contact one another and restrict bending of said flexible member in one direction of movement, and wherein said portions of said non-interlocking solids separate from one another when said flexible member is activated in an opposite direction of movement, thereby permitting said flexible member to bend and assume a curved configuration.

46. The support element of claim 45 wherein said portions of said non-interlocking solids further comprise projections and concavities in mateable relationship with adjacent non-interlocking solids that serve as means for maintaining linear alignment of said support member.

47. The support element of claim 45 wherein said plurality of said non-interlocking solids are attached to one side of said flexible material.

48. The support element of claim 45 wherein said plurality of non-interlocking solids restrict bending of said flexible material in one direction of movement when said flexible material is in a straightened configuration.

49. The support element of claim 45 wherein said length of flexible material and said non-interlocking, motion-limiting, solids are in the form of a single construct.

50. The support element of claim 45 wherein said non-interlocking solids each have a profile substantially in the shape of a capital letter "T."

51. The support element of claim 45 wherein said construct is metallic.

52. The support element of claim 45 wherein said construct is polymeric.

53. The support element of claims 51 wherein said solids are substantially similar in volume.

54. The support element of claims 52 wherein said solids are substantially similar in volume.

55. The support element of claim 45 further comprising an envelope surrounding said support member and at least one channel disposed substantially in parallel with said support member and attached to said envelope.

56. The support element of claim 55 wherein said channel is contiguous with said envelope.

57. The support element of claim 55 further comprising at least one conductor located within said at least one channel.

58. The support element of claim 55 wherein said envelope and said at least one channel comprise a polymeric material.

59. The support element of claim 58 wherein said polymeric material comprises polytetrafluoroethylene.

60. The support element of claim 55 wherein said envelope and said at least one channel are both a composite of urethane and polytetrafluoroethylene.

61. The support element of claim 60 wherein said polytetrafluoroethylene is expanded porous polytetrafluoroethylene.

62. A support member having a range of motion in one direction and essentially no range of motion in an opposite direction, said support member comprising:

a length of a first flexible polymeric material comprising a plurality of non-interlocking solids, wherein adjacent non-interlocking solids have portions that contact one another and restrict bending of said flexible member in one direction of movement, and wherein said portions of said non-interlocking solids separate from one another when said flexible member is activated in an opposite direction of movement, thereby permitting said flexible member to bend and assume a curved configuration; and

at least one layer of a second flexible polymeric material having at least one reinforcing element embedded therein attached to one side of said first flexible material.

63. The support member of claim 62 further comprising a length of a second flexible material comprising a plurality of non-interlocking solids attached to an opposite side of said at least one layer of material.

64. The support member of claim 62 wherein said plurality of non-interlocking solids restrict bending of said flexible polymeric material in one direction of movement when said flexible polymeric material is in a straightened configuration.
65. The support member of claim 62 wherein said reinforcing element is made of a metallic material.
66. The support member of claim 65 wherein the metallic material is in the form of a round filament.
67. The support member of claim 65 wherein the metallic material is in the form of a flat strip.
68. The support member of claim 67 further comprising a series of holes in said strip for attaching said plurality non-interlocking solids.
69. The support member of claim 62 wherein said reinforcing element is made of a polymeric material.
70. The support member of claim 62 wherein said solids are substantially similar in volume.
71. The support member of claim 62 further comprising an envelope surrounding said support member and at least one channel disposed substantially in parallel with said support member and attached to said envelope.
72. The support member of claim 71 wherein said channel is contiguous with said envelope.
73. The support member of claim 71 further comprising at least one conductor located within said at least one channel.
74. The support member of claim 71 wherein said envelope and said at least one channel comprise a polymeric material.
75. The support member of claim 74 wherein said polymeric material comprises polytetrafluoroethylene.

76. The support member of claim 71 wherein said envelope and said at least one channel are both a composite of urethane and polytetrafluoroethylene.

77. The support member of claim 76 wherein said polytetrafluoroethylene is expanded porous polytetrafluoroethylene.

78. A support member having a range of motion in one direction and essentially no range of motion in an opposite direction, said support member comprising:

a continuous strip of material comprising a series of non-interlocking, motion-limiting, solids, wherein adjacent non-interlocking solids have portions that contact one another and restrict bending of said flexible member in one direction of movement, and wherein said portions of said non-interlocking solids separate from one another when said flexible member is activated in an opposite direction of movement, thereby permitting said continuous strip to bend and assume a curved configuration, and
at least one reinforcing element embedded in said continuous strip.

79. The support member of claim 78 wherein said plurality of non-interlocking solids restrict bending of said flexible polymeric material in one direction of movement when said flexible polymeric material is in a straightened configuration.

80. The support member of claim 78 wherein said reinforcing element is made of a metallic material.

81. The support member of claim 80 wherein the metallic material is in the form of a round filament.

82. The support member of claim 80 wherein the metallic material is in the form of a flat strip.

83. The support member of claim 82 further comprising a series of holes in said strip for attaching said plurality non-interlocking solids.

84. The support member of claim 78 wherein said reinforcing element is made of a polymeric material.

85. The support member of claim 78 wherein said solids are substantially similar in volume.

86. The support member of claim 78 further comprising an envelope surrounding said support member and at least one channel disposed substantially in parallel with said support member and attached to said envelope.

87. The support member of claim 86 wherein said channel is contiguous with said envelope.

88. The support member of claim 86 further comprising at least one conductor located within said at least one channel.

89. The support member of claim 86 wherein said envelope and said at least one channel comprise a polymeric material.

90. The support member of claim 89 wherein said polymeric material comprises polytetrafluoroethylene.

91. The support member of claim 86 wherein said envelope and said at least one channel are both a composite of urethane and polytetrafluoroethylene.

92. The support member of claim 91 wherein said polytetrafluoroethylene is expanded porous polytetrafluoroethylene.